2015 International Conference on Control, Automation and Robotics

(ICCAR 2015)

Singapore
20 – 22 May 2015

IEEE Catalog Number: CFP15IWZ-POD
ISBN: 978-1-4673-7524-5

2015 International Conference on Control, Automation and Robotics

ICCAR 2015

Table of Contents

Message from the General Chairs.....**viii**

Message from Program Chairs.....**ix**

Conference Committees.....**x**

Session 1: Robot Design & Development Technology

Flexible Development Environment for Educational Robotics 1

Christoph Krofitsch, Wilfried Lepuschitz, Markus Klein, and Gottfried Koppensteiner

Touching an Android Robot: Would You do It and How? 8

Kerstin Sophie Haring, Katsumi Watanabe, David Silvera-Tawil, Mari Velonaki, and Yoshio Matsumoto

Kinematics of Parallel Mechanism Based Robot Manipulator with Passive Joints Variables.....14

J. M. Prajapati

Versatile Climbing Robot for Vessels Inspection.....18

Mohamed G. Alkalla, Mohamed A. Fanni, and Abdel-Fatah Mohamed

Method for Vectorial Robot Movement Determination Enabling Accuracy Improvements 24

A. Buschhaus, N. Apel, and J. Franke

Mobile Robot Path Planning in Environments Cluttered with Non-convex Obstacles Using Particle Swarm Optimization 32

Muhammad Shahab Alam and Muhammad Usman Rafique

A Decentralized Interactive Architecture for Aerial and Ground Mobile Robots Cooperation.....37

El Houssein Chouaib Harik, Frédéric Guinand, Hervé Pelvillain, François Guérin, and Jean-François Brethé

Applicability of Stereo High Speed Camera Systems for Robot Dynamics Analysis.....44

Kai Wu, Jan Brueninghaus, Benjamin Johnen, and Bernd Kuhlenkoetter

Sensors Fault Diagnosis in Autonomous Mobile Robots Using Observer - Based Technique.....49
George K. Fourlas,George C. Karras, and Kostas J. Kyriakopoulos
A New Approach to Inverse Kinematic Solution for a Partially Decoupled Robot 55
Lei Zhang, Junqiu Zuo, Xingguo Zhang, Xingtian Yao, and Liguo Shuai
Prototyping a Simple Small Smart Robotic Arm - Manipulator 60
Meteb Altaf, Eball Ahmad, Abdulmohsin Jarwali, Faisal Alateeq, and Faisal Alturki
An Investigation on the Application of Fuzzy and PID Algorithm in the Two Wheeled Robot with Self Balancing System Using Microcontroller.....64
Adik S. Wardoyo, Hendi S, Darwin Sebayang, Imam Hidayat, and Andi Adriansyah
Mobile Robot Path Planning for Circular Shaped Obstacles Using Simulated Annealing.....69
Sikandar Hayat and Zareena Kausar
Flying Wing Underwater Glider: Design, Analysis, and Performance Prediction 74
Wang Zihao, Li Ye, Wang Aobo, and Wang Xiaobing
Behavior-based Mamdani Fuzzy Controller for Mobile Robot Wall-following.....78
Xiao Li and Dan Wang
Robust Walking Control of a Planar Spring Mass Biped Robot.....82
Wenqi Hou, Honglei An, Taihui Zhang, Jian Wang, and Hongxu Ma
Kinematics Modeling of a 4-DOF Robotic Arm.....87
Amin A. Mohammed and M. Sunar

Session 2: Automation & Control Systems

Optimal Tuning of Scaling Factors and Membership Functions for Mamdani Type PID Fuzzy Controllers 92
Ana Sebastião, C. Lucena, L. Palma, A. Cardoso, and Paulo Gil
Scenario Based Approach for Control Design for DC-DC Buck Converter 97
Aisha Qamar, Kunwar Faraz Ahmed Khan, Asad Ullah Awan, and Muwahida Liaquat
Variable Robustness Control Design for System of Aerospace Vehicle 103
Syed Zeeshan Haider, Kunwar Faraz Ahmed Khan, Asad Ullah Awan, and Muwahida Liaquat
Design of Smart Home Monitoring System Based on ZigBee 109
Lu Chen and Heng Luo
Application of Intelligence Information Fusion Technology in Agriculture Monitoring and Early-warning Research 114
Zhuang Jiayu, Xu Shiwei, Li Zhemin, Chen Wei, and Wang Dongjie

The Self-Tuning PID Control in a Toggle Mechanism System by Knowledge-based Bounds.....118
Ching-Sheng Chi and Chin-Wen Chuang
A Hybrid System Approach to Static Var Compensator Modeling and Control.....122
Ky-Suong The Nguyen, Thanh-Trung Han, Hong Zhu, and Yuping Zhang
DSS Development on Toll Expressway Financial Risk Monitoring 129
Chu Chunchao
A Simple Pose Estimation Method Based on Co-planar Feature Points 134
Weigao Xu, Zuofeng Zhou, Jianzhong Cao, Bing Zhao, Weigao Xu, and Bing Zhao

Session 3: Mechanical Fault Detection & Diagnosis

Research on Automatic Testing System Compatible the Electricity Meters with Electric Energy Data Acquire Terminal 138
Xie Lu, Lu Jiping, He Peidong, Zou Xudong, and Zeng Rong
The Influence of Coupling Layer Thickness on Hollow Axles Ultrasonic Testing.....143
Dong Cai, Cheng Zou, Zhenguo Sun, Qingxiang Zhou, Ye Fu, and Guangkai Li
Simulation Analysis of Ultrasonic Inspection of Hollow Axle with Different Segments 148
Qingxiang Zhou, Ye Fu, Guangkai Li, Dong Cai, Cheng Zou, and Zhenguo Sun
Detection of Longitudinal Cracks with a Serrated Columnar Phased Array Transducer: A Simulation Study.....153
Cheng Zou, Dong Cai, Zhenguo Sun, and Xia Liu
Design of Automobile Fuel Injection Signal Detection Device 158
Xue-xi Duan and Yun-ling Wang
Multiplicative Fault Estimation Using Sliding Mode Observer with Application.....163
Chen Wu

Session 4: Industrial & Engineering Applications

Job Shop Scheduling with Flexible Routings Based on Analytical Target Cascading 168
Yanguang Li, Guanghui Zhou, and Zhongdong Xiao
Design of Explosive Production Information and Managing System Based on Internet of Things……..……173
XU Qin and Wang Ying
Performance Analysis and Comparison between Two Forms of Double EWMA Controllers in Industrial Process.....177
Qing-Song Gong, Gen-Ke Yan, Moon-Sang Lee, and Chang-Chun Pan

An Intelligent Automation System of Yeast Fermentation Industry 182
JingJing Shi, Weidong Guo, and Ali Zhao

Session 5: Scheduling & Algorithm

Fast Range-based Localization of Targets Using Particle Swarm Optimization.....186
Vidya Viswanathan, Soumya Jana, and Shanti Swarup

Differential Evolutionary Algorithms with Novel Mutation Operator for Solving the Permutation Flowshop Scheduling Problem 191
Chi-Hua Tien,Meng-Hui Chen,Chia-Yu Hsu, and Pei-Chann Chang

A Hybrid Two-stage Sweep Algorithm for Capacitated Vehicle Routing Problem 195
Meng-Hui Chen, Ching-Ying Chiu, Pei-Chann Chang, and Sivachandra Prabhu Annadurai

A Hybrid Edge Recombination Approach to Solve Price Collecting Vehicle Routing Problem……..200
Anurag Tiwari, Gouthaman Elangovan, Pei-Chann Chang, and Sivachandra Prabhu Annadurai

The Ecological Optimization Dispatch of the Three Gorges Reservoir Considering Aquatic Organism Protection.....204
Chao Wang, Jianzhong Zhou, Xuemin Wang, and Cheng Zhang

An Intention Based Manipulation Method of Large Models in Virtual Environment.....209
Wang Dawei and Yang Hongyan

A Novel Nonlinear Model Parameters Identification Algorithm 214
Tang Bin, Wu Honggang, Mo Lei, and Zheng Xiaoxia

Session 6: Image Processing & Intelligent Recognition

Pineapple Quality Grading Using Image Processing and Fuzzy Logic Based on Thai Agriculture Standards 218
Bandit Suksawat and Preecha Komkum

Ultrasonic Sensor Based Approach for Identifying the Camera ROI 223
Pradeep S., Avinash N., and Shashi Kumar M. S.

Novel Methodology for Guiding Attention of Faces through Relative Visual Saliency (RVS).....228
Ravi Kant Kumar, Jogendra Garain, Goutam Sanyal, and Dakshina Ranjan Kisku

Mobile Based Palmprint Recognition System 233
Li Fang and Neera

A Novel Algorithm for People Detection in Grey Scale Thermal Images 238
Laith A. H. Al-Shimaysawee, Ali H. A. Aldabbagh, and Nasser Asgari

Dynamic Display of River Boundary on Electronic River Chart 244
Zuochang Yang and Hongxiang Ren

Author Index..... 249